

Instream Flows: Purpose and Methodology

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Overview

- Instream flows in WA
 - Legal authority
 - Distribution
 - Species of interest
 - Methods

Instream Flows in Washington



- Water right for the stream, do not affect senior rights
- Set by WDOE with scientific guidance from WDFW
- Protect and restore habitat for fish and wildlife



Legal Authority



Federal Statute

- Clean water act
- Endangered species act

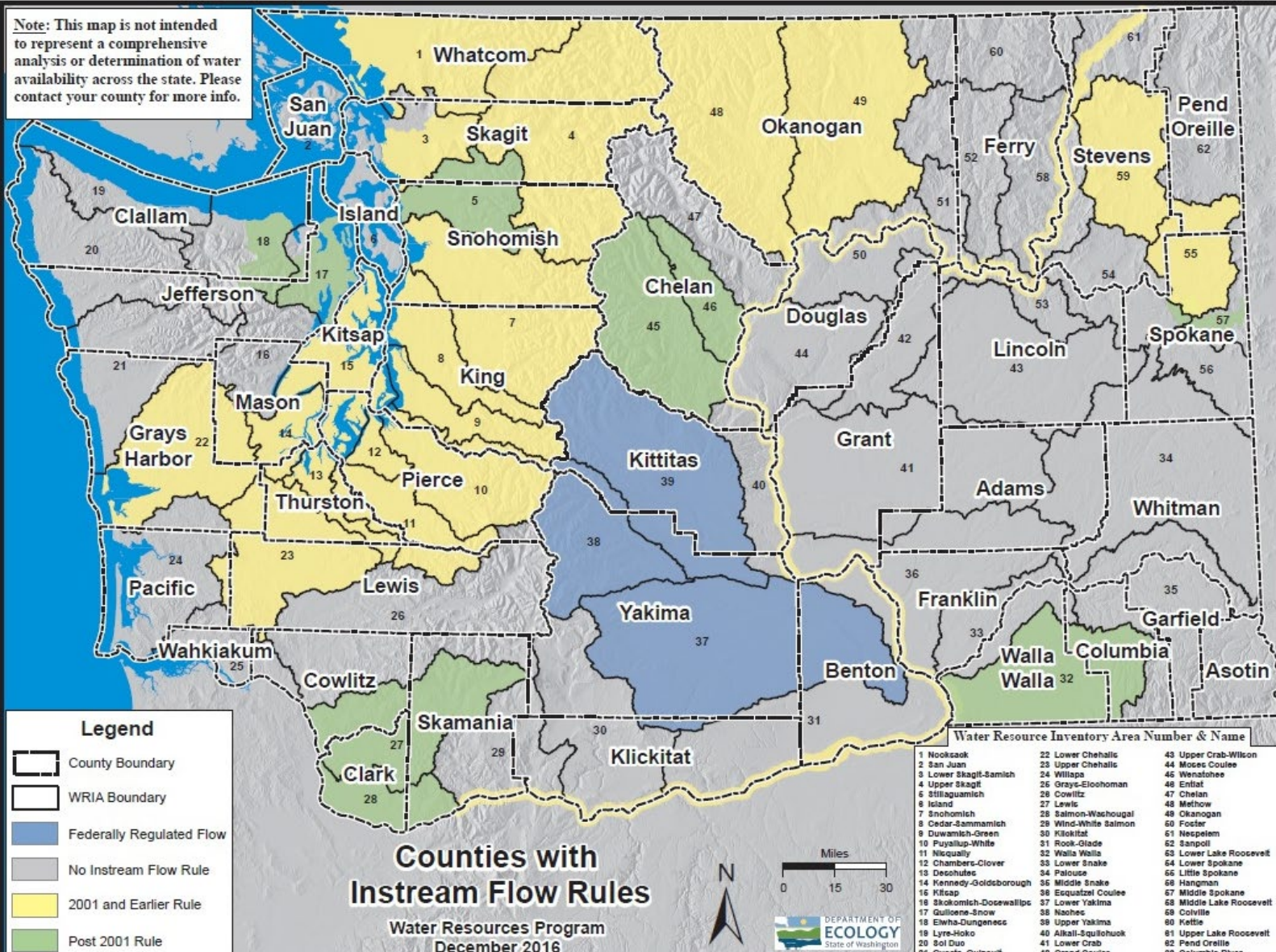
State Statute

- Water code RCW 90.03.247
- Minimum water flows and levels RCW 90.22
- Water resources act of 1971 RCW 90.54
- Watershed planning act RCW 90.82.080 and 90.94
- Construction projects in state waters RCW 77.57.020

Water Flow Policy Act, 1949:

“It is the policy of this state that a flow of water sufficient to support game fish and food fish populations be maintained at all times in the streams of this state”

Basins with Instream Flow Rules



Sea-run Salmonids and Char of WA



- Chinook (King) Salmon *Oncorhynchus tshawytscha*
- Coho (Silver) Salmon *Oncorhynchus kisutch*
- Pink (Humpy) Salmon *Oncorhynchus gorbuscha*
- Chum (Dog) Salmon *Oncorhynchus keta*
- Sockeye (Red) Salmon *Oncorhynchus nerka*
- Steelhead (Rainbow Trout) *Oncorhynchus mykiss*
- Cutthroat Trout (Coastal) *Oncorhynchus clarki clarki*
- Bull trout *Salvelinus confluentus*

Technical studies to set instream flows



How do suitable combinations of water depth and velocity associate with suitable bed material for different life stages of salmonids in the system of interest?

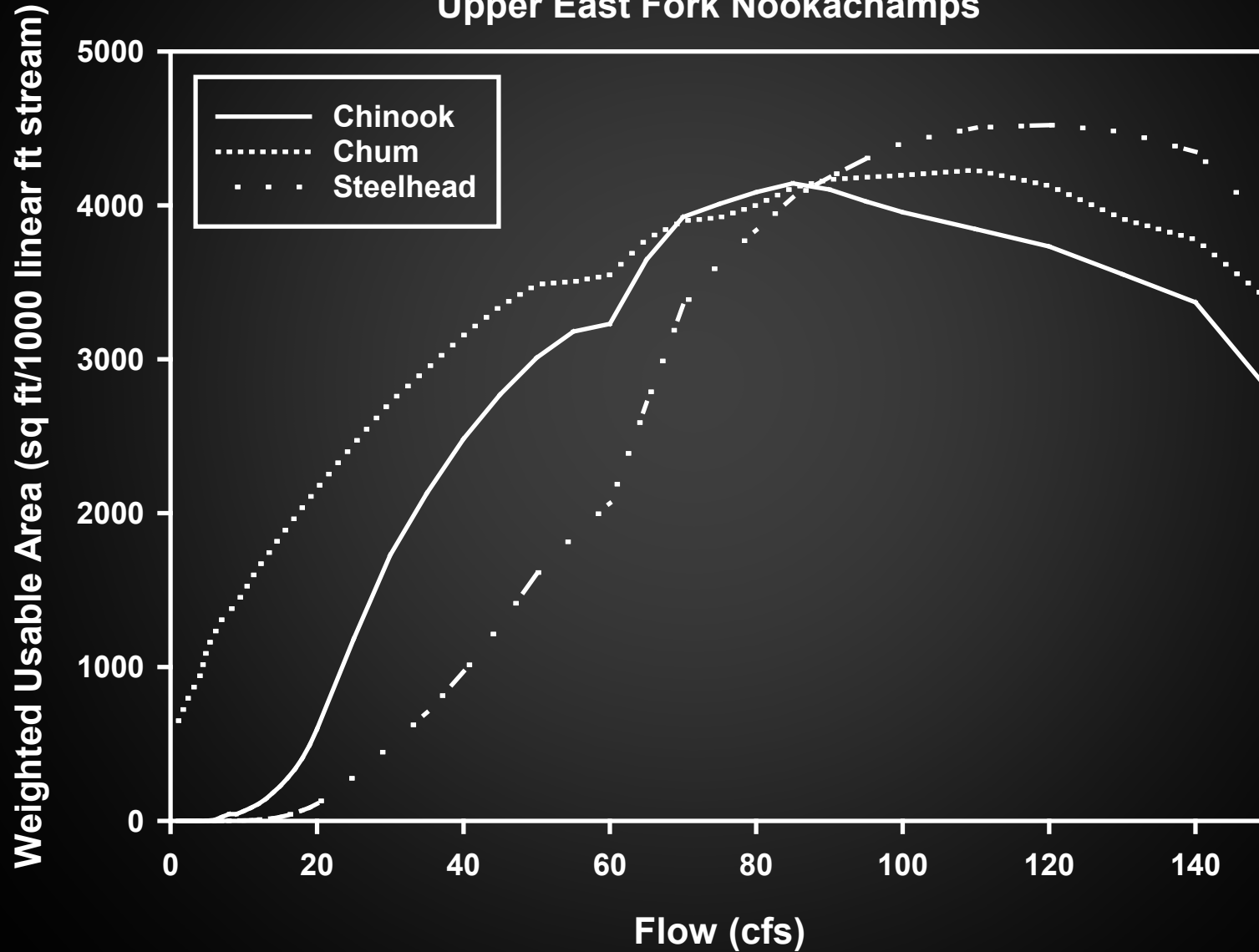
Approach:

- IFIM/PHABSIM study
- Conduct hydraulic surveys at different discharges
- Model hydraulics
- Model habitat based on suitability of hydraulics
- Generate index of change in habitat relative to change in discharge, Weighted Usable Area

Weighted usable area



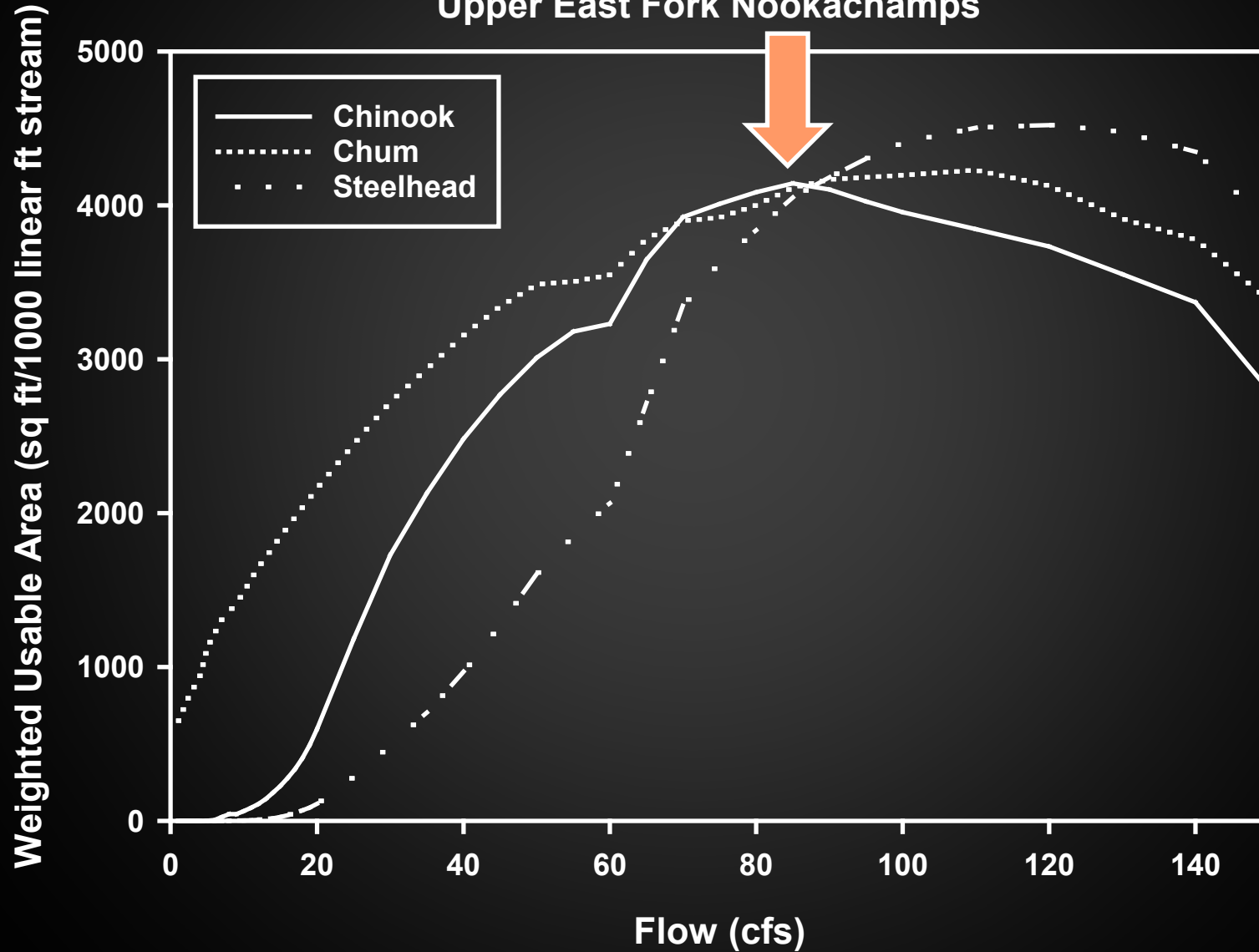
Spawning Weighted Usable Area vs Flow
Upper East Fork Nookachamps



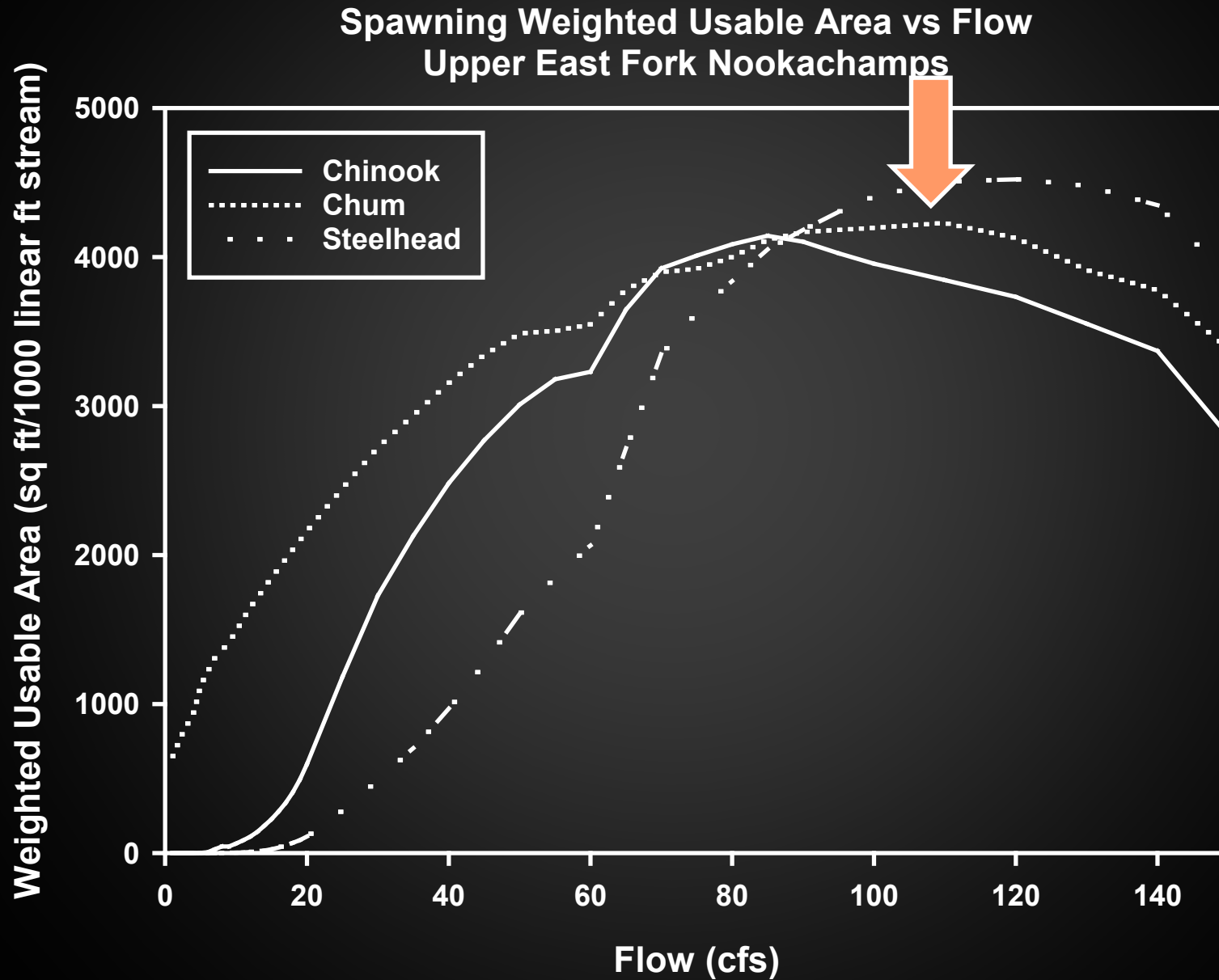
Weighted usable area



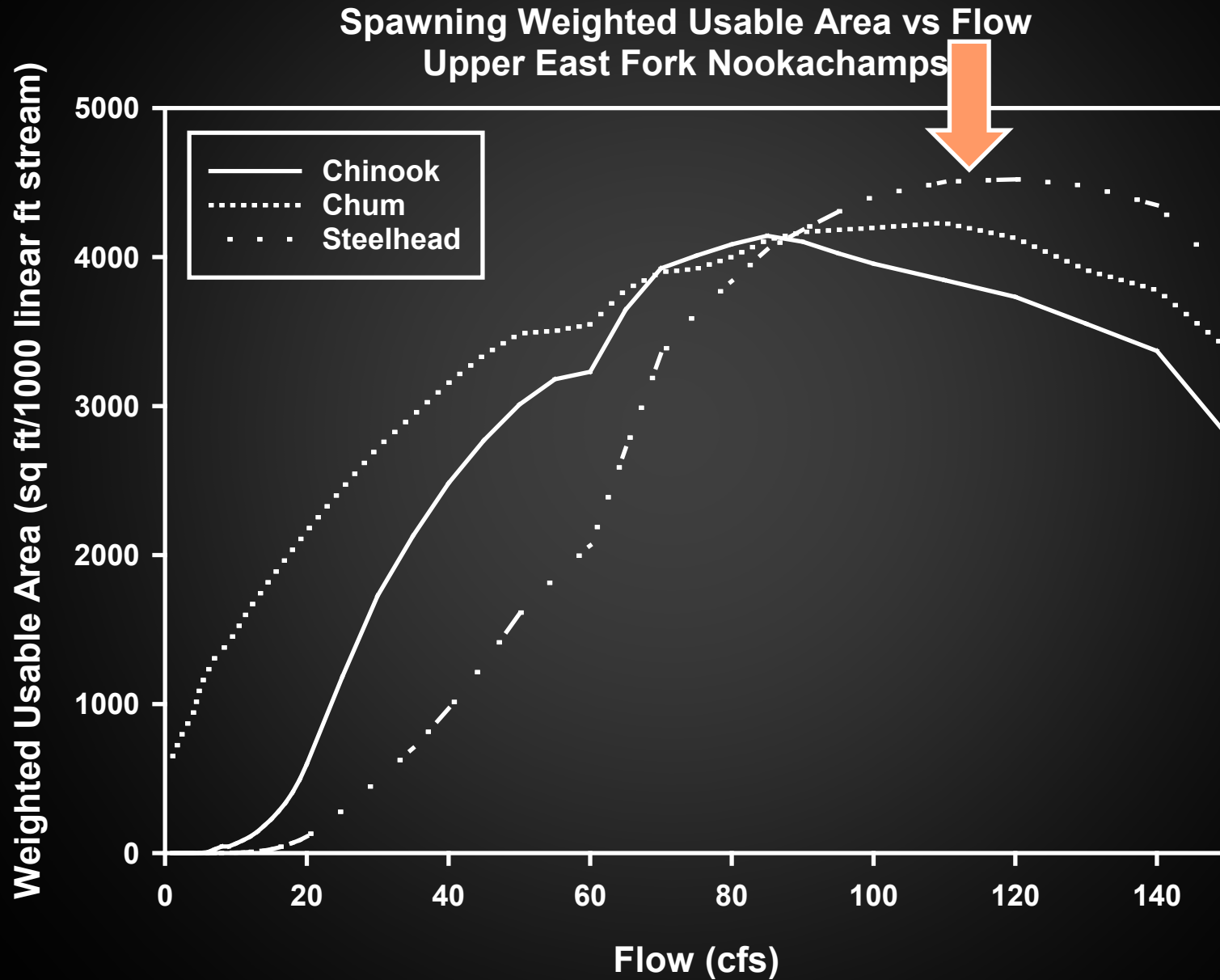
Spawning Weighted Usable Area vs Flow
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Weighted usable area



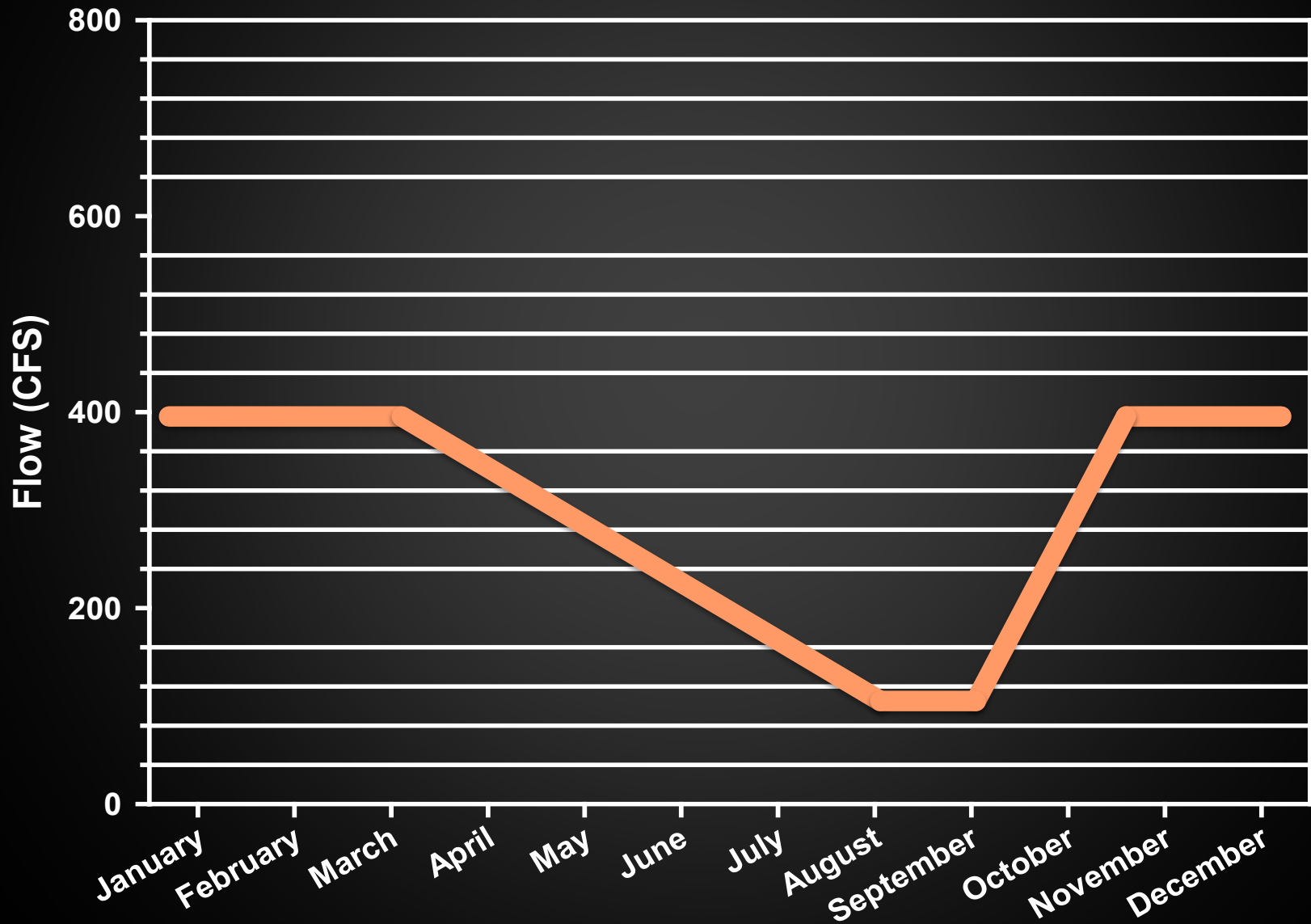
Weighted usable area



Instream Flows in Washington



Deschutes River Instream Flow Rule



Instream Flow Rules Summary



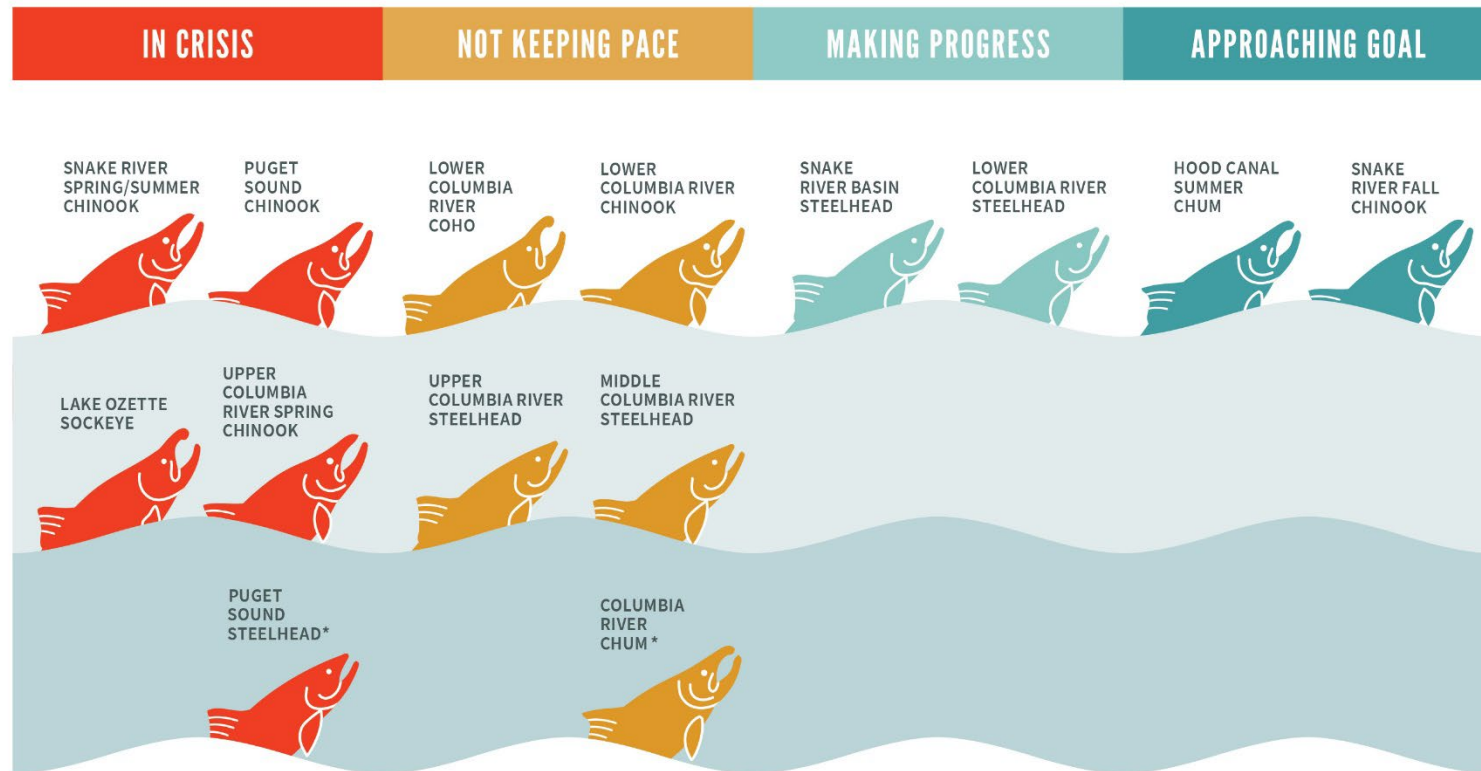
- Legacy of instream flow protection in WA
- Set by WDOE
- Recommendations based on empirical knowledge



Instream Flows and Salmon Recovery



Salmon Abundance



* Lacks complete data

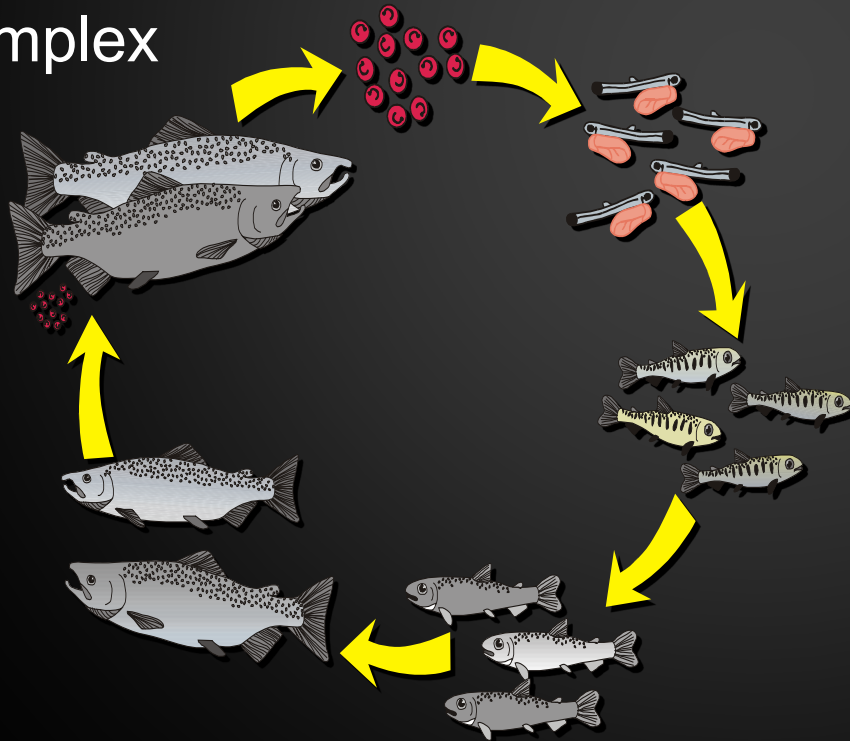
Data Source: Washington Department of Fish and Wildlife

Instream Flows and Salmon Recovery



Salmon Habitat Requirements – the 4 C's

- Clean
- Cold
- Connected
- Complex

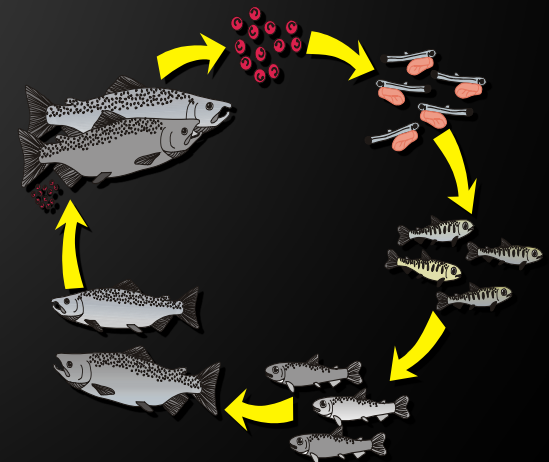
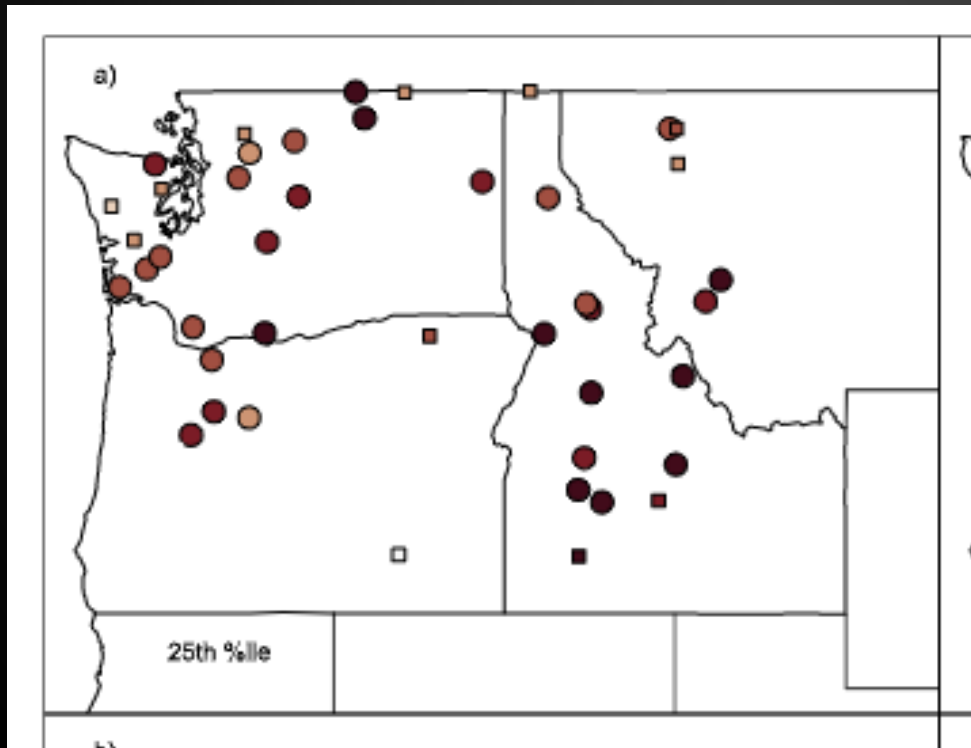


Instream Flows and Salmon Recovery

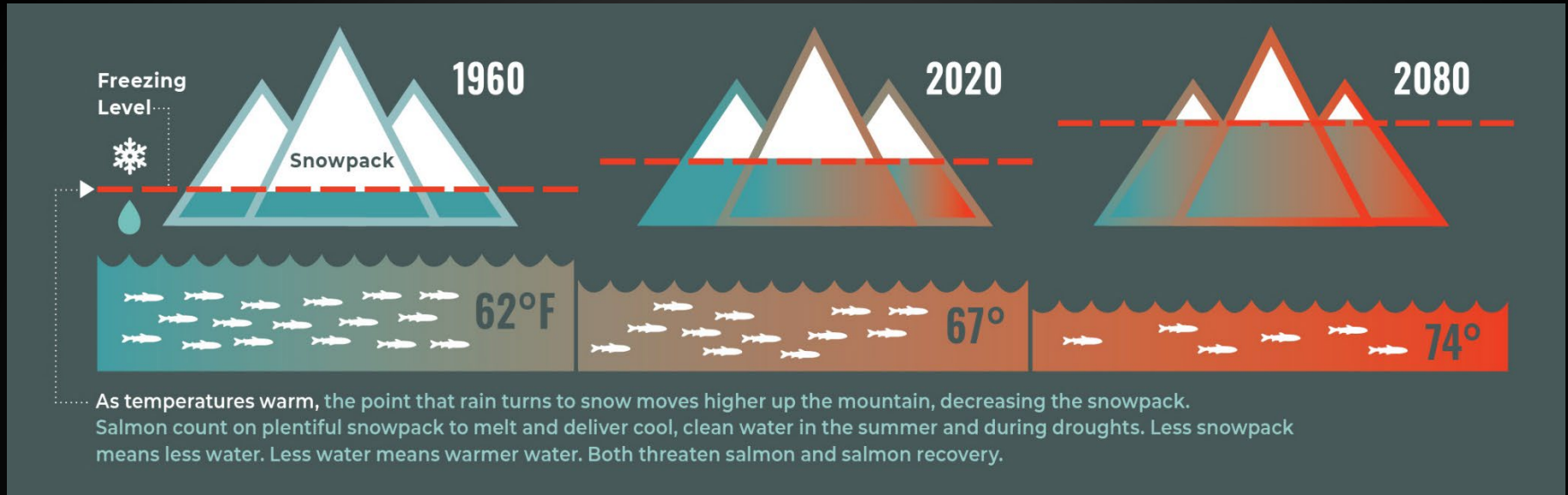


Over 50% of Washington watersheds are experience lower summer base flows over the past 50 years.

Restoring instream flow has become a top priority for many salmon recovery regions throughout the state.



Instream Flows and Salmon Recovery



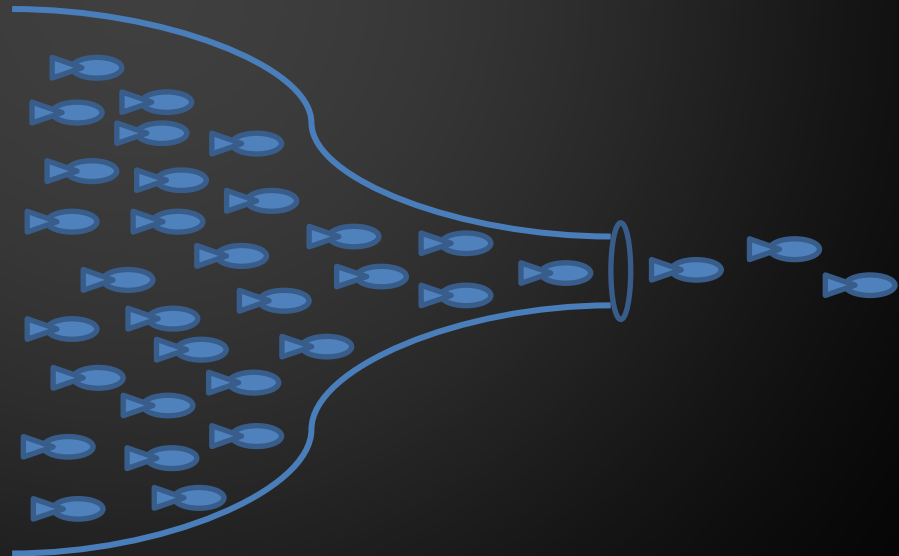
Lower summer flows means warmer water temperatures and reduced survival.

Instream Flows and Salmon Recovery

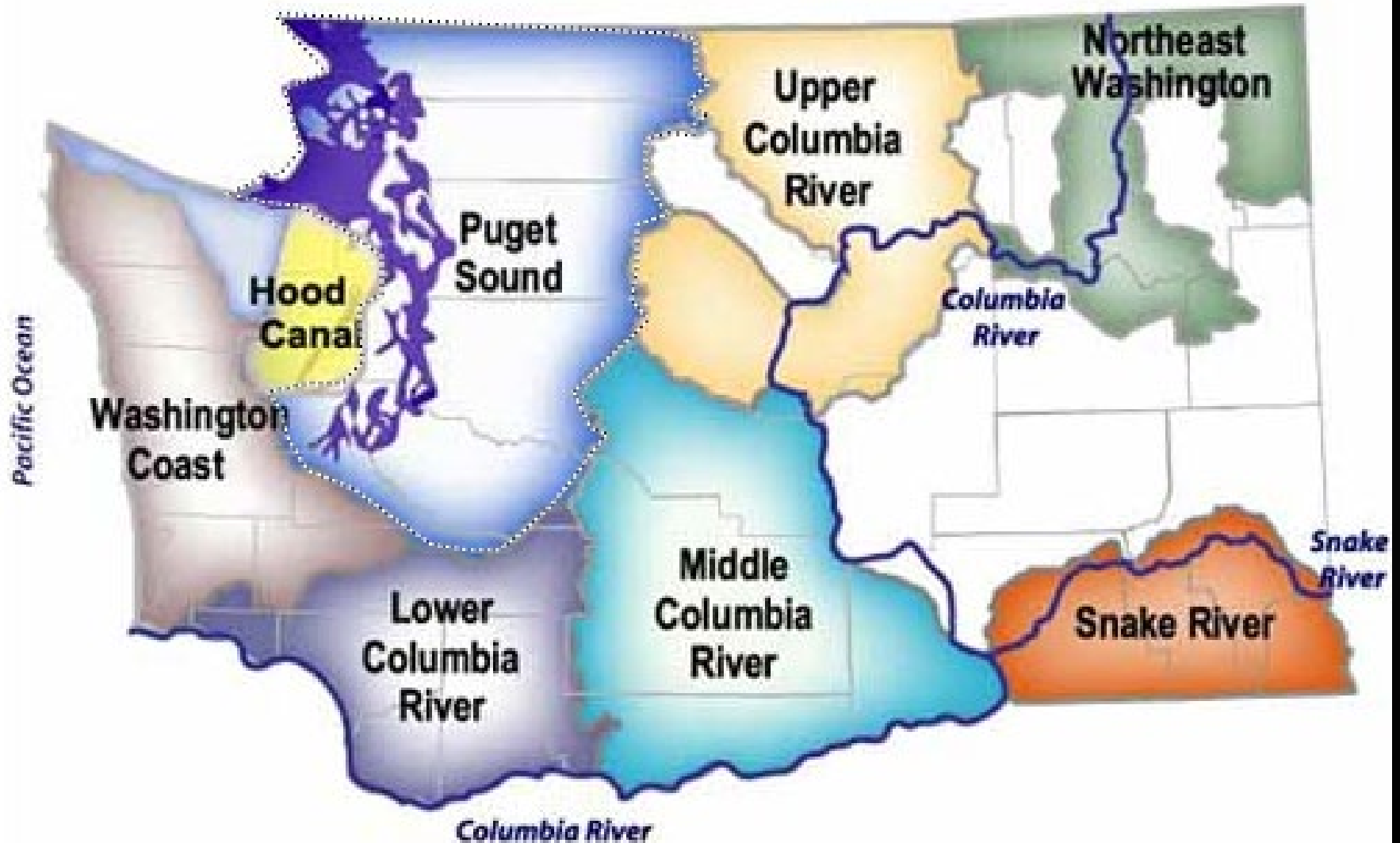


Research priorities in salmon conservation related to stream flow:

- PSM of adult salmon
- Incubation survival
- Juvenile salmon survival and capacity
- Life history pathways
- Coldwater refugia
- Predation



Instream Flows and Salmon Recovery



Instream Flows and Salmon Recovery



Restoration actions to address stream flow:

- Modernize surface water diversions
- Irrigation efficiency
- Riparian and floodplain restoration
- Augmentation of thermal refuges
- Beaver reintroduction and translocation



Thank you!

